HISTORY OF THE LAND VERTEBRATES COLLECTION AT AUCKLAND MUSEUM, NEW ZEALAND, 1852-1996

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Abstract. Land vertebrates, especially birds, have been an important part of the Auckland Museum collection since the museum's foundation in 1852. Auckland Museum grew rapidly in the last quarter of the 19th Century, at a time when natural history and ethnology museums were flourishing throughout the Western world. This period of growth was expertly guided by T.F. Cheeseman, a botanist, who ran Auckland Museum for nearly 50 years from 1874. The collection of land vertebrates was enhanced by major exchanges of specimens that Cheeseman negotiated with foreign museums, and dealers like H.A. Ward, during the period 1875-1905. The museum's first attempt to show land vertebrates in the context of their habitats were small displays of tuataras and keas in 1886. "Habitat groups" were a constant feature of Auckland Museum's natural history displays from 1912. The bird gallery in the 1929 building, continuously improved, served for 40 years. Its replacement in the 1960 extension, containing some large and superb dioramas, remained open for 24 years. This article traces the development of land vertebrates exhibits and reference collections at Auckland Museum to 1996. Staff who had charge of the collections (besides Cheeseman) included L.T. Griffin, G.E. Archey, R.A. Falla and E.G. Turbott. Taxidermists who prepared specimens for the collection included I. St John, A. Reischek, C.F. Adams, L.T. Griffin, C.W. Dover and P.J. O'Brien. Particular attention is given to some of the larger display items, to the oldest specimens in the collection and to the sources of major acquisitions of specimens.

KEYWORDS: Birds; moas; mammals; "Rajah" the elephant; museum collections; registration; exchanges of specimens; museum exhibits; dioramas; curators; taxidermists.

INTRODUCTION

New Zealand's four main natural history museums, geographically spread in what are today's four major centres (Auckland, Wellington, Christchurch and Dunedin), all began in the Victorian era. Auckland Museum is one of the oldest, founded in 1852, just 12 years after New Zealand became a British Colony. For much of its history Auckland Museum has also been known as the "Auckland Institute and Museum" (1867-1996) and "Auckland War Memorial Museum" (1929-present).

At their humble beginnings in the young colony, the New Zealand museums had little money and sole-charge, often honorary, curators. There were problems in expertly preparing natural history specimens and storing and displaying them properly. Much material was sent directly to northern hemisphere experts and institutions, particularly in Britain, for determination or description. Thus, New Zealand museums tend to have little local natural history material from before 1880, and any specimens surviving from this era tend to be poorly documented.

In the late Victorian years, New Zealand museums reached a sounder footing, at a time when natural history museums around the world were flourishing (Sheets-Pyenson 1988). The curators, still mostly sole-charge, were notable scientists of the time, and the natural history collections were enriched by international exchanges of specimens. The New Zealand museums became major scientific institutions (Cheeseman 1917). Their scientific output has continued, but by the 1940s they were overshadowed in this role by the growth of the universities, and the rise of government research departments.

Since the 1920s, when budgets or attitudes began to allow appointment of multiple specialist curators, New Zealand's main museums have sought to emulate the great museums of Europe and North America by providing modern displays and developing and maintaining large reference and research collections.

By considering the history of the land vertebrates collection (birds, reptiles, amphibians and non-cetacean mammals) at Auckland Museum, I have sought to trace the growth and development of a New Zealand natural history collection. One of the objectives of Auckland Museum at its founding was "to collect specimens illustrative of the natural history of New Zealand" (Powell 1967: 8). Land vertebrates were important from the start, for the founding collection comprised "... some handsome stuffed birds, shells, insects, and various other things amongst which an hour may be very agreeably and instructively spent" (*The New Zealander* 27 October 1852).

Started with a few stuffed birds provided by local colonists, the Auckland Museum land vertebrates collection now comprises 800 land mammal specimens, 2,000 amphibians and reptiles, 11,200 birds and 29 primary type specimens (Gill 1983 and unpublished). The end-point for this review is 1996, in March of which the 1972 Hall of New Zealand Birds closed to the public and was dismantled.

Throughout this paper "Ann. Rep." refers to the *Annual Report of the Auckland Institute and Museum*, first published in 1871 for the financial year 1870-71. Previous papers dealing with Auckland Museum's history are Cheeseman (1917), Powell (1967), Mason (1996) and Park (1999).

MUSEUM BUILDINGS

When Auckland Museum was founded in October 1852 it occupied two rooms in a farm cottage on the hill above the town, near what is now the junction of Grafton Road and Symonds Street (Powell 1967). In 1867 the museum moved to a large room in the present Northern Club building in Princes Street. From 1869 to 1876, Auckland Museum occupied the "old Post Office", a humble wooden structure also in Princes Steet. On this site a new museum building was erected (Fig. 1). It was officially opened on 5 June 1876 by the Governor, the Marquis of Normanby (Cheeseman 1917), and was subsequently extended several times.

The museum moved to a new building on a hill in the Auckland Domain opened on 28 November 1929 by the Governor-General, General Sir Charles Fergusson. The building is a memorial to those from the former Auckland Province who died in the Great War (1914-18). It contains three floors (ground, first and second), devoted then, as now, largely to display galleries. The 1929 building was later doubled in size by extension to the rear. Work began on the extension in 1956 and it was opened on 19 March 1960 by the Governor-General, the Viscount Cobham (Powell 1967). The extension was built in memory of those from the Auckland provincial area who lost their lives in World War II (1939-45). The extension contains additional gallery spaces on three floors extending those in the front part of the building. The curved rear portion of the extension contains administrative and storage areas on four floors (ground, mezzanine, first and second). The extended building is the museum's present home.

Fig. 1. The 1876 museum building, Princes Street, 15 August 1917. The inscription on the facade reads "Institute and Museum". The large building to the right is the 1892 extension. Cheeseman's office was behind the two windows at ground level left of the entrance. The building has not survived. Photo: H. Winkelmann (Auckland Museum Library, C23824).

STAFF

The museum's collections during its earliest years were under the care of a succession of local citizens, most notably John Alexander Smith (1814?-1889), the museum's founder (Park 1999). These honorary curators were nearly all amateurs, and with the study of natural history in the colony at its infancy, making sense of many exhibits was difficult. Even putting a name to birds was a problem, as shown by an 1856 letter from Smith to St John, a taxidermist in Nelson, in which Smith mentioned a "Black & White Bird with Red Bill" (Park 1999), presumably an oystercatcher (*Haematopus*).

One honorary curator who went on to become prominent in New Zealand zoology was Frederick Wollaston Hutton (1836-1905), who appears to have had charge of the collection in 1867, arranging it in the new premises after the move to the Northern Club building (Park 1999). For a full account of those overseeing the museum from 1852 to 1867, see Park (1999). From 1868 to 1874 it seems the museum was run by Thomas Kirk (1828-1898), a botanist (Powell 1967). Staff who have had a managerial or technical connection with the land vertebrates collection at Auckland Museum, beginning with Kirk, are listed in Table 1.

Thomas Frederic(k) Cheeseman (1845-1923; Fig. 2) was appointed sole curator of the museum in 1874 and headed the museum for half a century until his death (Cockayne 1923, Goulding 1996, Powell 1967). Born in Yorkshire, he came to New Zealand with his parents at eight years old. Cheeseman was primarily a botanist, but published also on zoology and ethnology. Among many honours he was elected a Fellow of the New Zealand Institute, and of the Linnean and Zoological Societies of London.

Table 1. Staff who have managed the land vertebrates collection at Auckland Museum, 1868-1996. The asterisk (*) indicates responsibility wider than the land vertebrates collection. See Park (1999) for details of honorary curators during the period 1852-1867.

Person	Title and period employed
T. Kirk	Secretary, Auckland Institute* 1868-74
T.F. Cheeseman	Curator* 1874-1923
L.T. Griffin	Assistant/Preparator* 1908-22, Assistant Curator* 1923-35
G.E. Archey	Curator* 1924-29, Director* 1929-64
R.A. Falla	Honorary Ornithologist 1928-30, Ornithologist 1931-35, Assistant Director* 1935-37
E.G. Turbott	Assistant Zoologist* 1937-43, Ornithologist-Entomologist* 1945-57, Director* 1964-79
G.A. Buddle	Acting Ornithologist 1943-45, Associate Ornithologist (part-time) 1945-51
L.J. Wagener (née Bishop)	Recorder (Zoology)* 1960-68
H.R. McKenzie	Associate Ornithologist (part-time) 1968-72
S.M. Reed	Associate Ornithologist (part-time) 1972-81
B.J. Gill	Curator of Land Vertebrates 1982-present
J.L. Riley (née Oats)	Zoology Technician* 1987-96

In 1908, Louis Thomas Griffin (1871-1935; Fig. 3) was appointed assistant to Cheeseman and Preparator. He had trained at Regent's Park Zoo, London, and had worked in South Africa at Pretoria's National Zoological Garden (Wood 1992), and as Preparator at museums in Capetown and Pretoria. Among many duties at the museum, Griffin catalogued much of the land vertebrates collection, and conducted research on fish taxonomy.

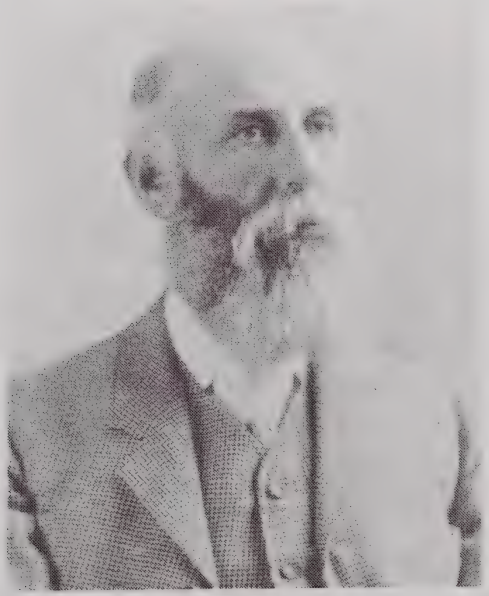


Fig. 2. T.F. Cheeseman, c. 1900 (Auckland Museum Library, C27027).

Fig. 3. L.T. Griffin in a basement workroom at Auckland Museum, 1909. Photo: *New Zealand Graphic* (Auckland Museum Library, C8689).

Cheeseman was succeeded as Curator by Gilbert Edward Archey (1890-1974), who was also Yorkshire-born, and who came to New Zealand with his parents at the age of two. The title of Curator was changed to Director in 1929 with the move to the new building. Archey had broad interests and pursued zoology early in his career, later diverting much attention to the study of Maori art (Turbott 1975). He amassed most of the museum's large moa bone collection and published a major study of moas (Archey 1941). His career as Director was interrupted by war service, with the home forces from 1939 (as Lieutenant-Colonel) and then with the British Military Administration in Malaya until 1947. He was knighted in 1963.

By the late 1920s the museum had grown to the extent that specialised curators were required. Robert Alexander Falla (1901-79; born in Palmerston North) was appointed Honorary Ornithologist in 1928. He was granted leave from, and later left, Teacher Training College in Auckland to work as Assistant Zoologist on Sir Douglas Mawson's British, Australian, New Zealand Antarctic Research (B.A.N.Z.A.R.) Expeditions during the summers of 1929-30 and 1930-31 (Fleming 1980). He took up a permanent position as Ornithologist at the museum in 1931 and managed the bird collection until 1937 when he left to become Director at Canterbury Museum.

In 1937, Evan Graham Turbott (1914- ; born in Auckland) was appointed Assistant Zoologist. He had completed an M.Sc. study on the biology of one of New Zealand's native frogs, but the main interest during his career was to be birds. Turbott was absent 1943-45 on war service that included a year at the coast-watching station on the subantarctic Auckland Islands as part of the "Cape Expedition". During this time Geoffrey Armstrong Buddle (1887-

1951) was Acting Ornithologist. Buddle was a Gallipoli veteran and pioneering nature photographer (Sibson 1975). He continued as part-time Associate Ornithologist from 1945 until his death, and in this time he catalogued much of the egg collection. Turbott continued to have oversight of land vertebrates until he left in 1957 for a position at Canterbury Museum.

Lois J. Wagener née Bishop served as Recorder (Zoology), 1960-68. Among various duties she prepared skeletal specimens and recatalogued and reorganised Archey's moa bone collection. Turbott returned to Auckland Museum as Director in 1964. The daily running of the land vertebrates collection was undertaken from 1968 to 1981 by part-time amateur Associate Ornithologists. Hector Ross McKenzie (1897-1981) of Clevedon (Brown 1990) served in this capacity from 1968 until 1972. Sylvia Mary Reed (1915-81) succeeded him in 1972 until her death (Sibson 1982). She greatly expanded the collection of bird and mammal bones. During the 1970s, Arthur Brett Stephenson (1945-), the museum's Marine Biologist, had partial oversight of the herpetology and mammalogy collections.

The collection was again managed full-time by a zoologist when Brian James Gill (1953-) was appointed Curator of Land Vertebrates in 1982. From 1987 to 1996 he was assisted part-time by Jenny Louise Riley née Oats (1964-).

TAXIDERMY

Table 2 lists all those known to have been engaged to prepare specimens of land vertebrates for Auckland Museum to 1996. In the period before 1880 only one name has come to light. Correspondence of the museum's founder, J.A. Smith, shows that in 1856-57 the museum engaged the collector and taxidermist Mr I. St John of Nelson to supply mounted native birds that he had caught and prepared locally (Park 1999). That St John worked from afar was presumably tolerated because there were so few with taxidermy skills in the young colony.

Many of the birds and mammals received by the museum in the 1800s, including those exchanged internationally, seem to have arrived in an unfinished condition and required the attentions of a taxidermist before they could be displayed. In 1878-79, some 300 birds and 30

Table 2. Taxidermists, preparators and technicians who have been engaged to prepare specimens of land vertebrates for Auckland Museum, 1856-1996.

Person	Period engaged
I. St John	1856-57
A. Reischek	1880-81
C.F. Adams	c.1885-87, c.1889
L.T. Griffin	1908-35
C.W. Dover	1929-1953
P.J. O'Brien	1953-58
L.J. Wagener	1960-68
L.J. Cappel	1964-82
T.A. Jenkins	c.1966-1984
M. McCluskie	c.1972-1982
B. Wadham	c.1984-1987
J.L. Riley	1987-96

mammals were able to be mounted and placed on exhibition (Ann. Rep. 1878-79: 10) implying some access to a taxidermist. However, the following year it was noted that all mammals and birds received in the past two years were "still packed away in cases, the funds of the Institute not being sufficient to defray the salary of a taxidermist" (Ann. Rep. 1879-80: 9).

The museum's first notable taxidermist was the Austrian Andreas Reischek (1845-1902). "A temporary arrangement has been made with the well-known taxidermist, Mr A. Reischek, and a large proportion of the skins that have been accumulating for the last few years has already been set up" (Ann. Rep. 1880-81: 9). His engagement was made possible by a donation of £25 from a private benefactor, and by the raising of over £60 by a "Conversazione" held at the museum on two evenings in September 1880 (Ann. Rep. 1880-81: 9, Powell 1967: 16). The 1881-82 annual report indicates that Reischek was retained for only a portion of that year, "remounting and adding fresh specimens to the collection of New Zealand birds". There was another fund-raising conversazione in June 1881 (King 1981: 66).

Reischek was an energetic hunter and an accomplished taxidermist (King 1981, Prebble 1993, Westerskov 1990). He spent 12 years in New Zealand (1877-1889). The Reischek specimens surviving in the Auckland Museum collection were collected or received between 1878 and 1888. However, it seems he was employed as Taxidermist at Auckland Museum only during the period 1880-81, after which New Zealand bird skins and skeletons were purchased from him (e.g. Ann. Rep. 1885-86).

Auckland Museum gave Reischek a citation dated February 1889, signed by Cheeseman and the president and vice-president of the museum's governing body (Aubrecht 1995). It records appreciation of the "valuable services rendered to the cause of science in New Zealand by Mr A. Reischek", referring to "12 years of unwearying and enthusiatic devotion in studying the Natural History ... of the Colony" and to his "valuable and generous aid in enriching the Natural History Collections in the Museums of the Colony".

The 1882-83 annual report indicates that a taxidermist could not be paid for that year, but a "competent osteologist" was engaged temporarily to prepare some articulated skeletons. In the 1883-84 year a permanent taxidermist looked imminent ("a thoroughly competent workman has been selected, and in a few months will arrive in Auckland"), however, he died and another had to be selected (Ann. Rep. 1884-85). H.A. Ward of Rochester, U.S.A., made the selection, and the taxidermist arrived in Auckland (Ann. Rep. 1884-85: 7), presumably from America. In the next annual report no taxidermist is mentioned, but it seems that Ward selected C.F. Adams (of Illinois, U.S.A.), described in the 1888-89 annual report (p. 7) as having been "formerly employed as taxidermist to the Museum". In 1886-87 further birds were mounted for exhibition (Ann. Rep. 1886-87), presumably by Adams. No taxidermist was employed the following year (Ann. Rep. 1887-88). Adams had evidently returned to the United States, but in 1889-90 a collection of Bornean mammal skins purchased from him were "placed in his hands for mounting" (Ann. Rep. 1889-90).

The annual report of 1895-96 lamented that the museum's inability to employ a taxidermist meant that an opportunity was lost to obtain a large adult leathery turtle *Dermochelys coriacea* that had been captured in the Bay of Islands. This state of affairs continued—for example: "The Zoological department is practically at a standstill from the inability of the Institute to employ a taxidermist" (Ann. Rep. 1900-01). The last such complaint was in the 1907-08 annual report where it was stated that New Zealand's other main museums each had a taxidermist on the permanent staff. Finally in 1908 it was resolved to employ "a resident taxidermist, or preparator of specimens" (Ann. Rep. 1908-09).

Following enquiries in Britain and the U.S.A., L.T. Griffin was recruited from South Africa. The following year all the exhibited birds and mammals were "cleaned and renovated, and

remounted in a more modern style" (Ann. Rep. 1909-10). Many inferior and faded New Zealand birds were replaced by better and "more artistically-mounted examples". Griffin experimented with "gelatine casts" of tuataras (*Sphenodon*) and other reptiles which were painted for display (Ann. Rep. 1910-11). Among his activities in the 1911-12 year he mounted 81 reptiles, birds and mammals, as well as preparing study-skins, alcoholic specimens, skeletons and casts. He built a reconstruction of the giant moa *Dinornis giganteus* (Figs 14, 17) in 1912 and 1913 using emu feathers, and mounted several large specimens, including an ostrich, for a new case containing ratite birds (visible in background of Fig. 7).

Charles W. Dover (Fig. 4) was an accomplished taxidermist of the British school (E.G. Turbott, pers. comm.) and served at the museum for 24 years. He prepared excellent mounts and study-skins, redid field skins prepared by Falla and Turbott, prepared mounts and skins from spirit specimens, and relaxed mounts. He mounted the Indian elephant "Rajah" (Fig. 4) that was displayed for many decades. In 1934 "a fine series of water-colour drawings of native birds, by Mr Dover" was exhibited as part of a special exhibition on the natural history of the

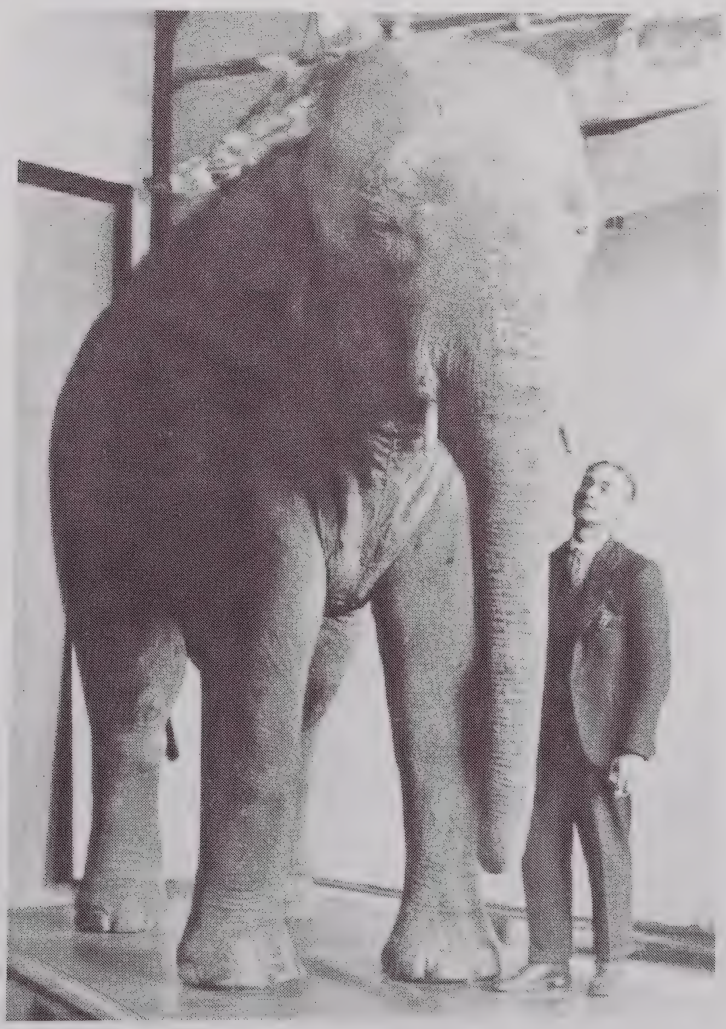


Fig. 4. The taxidermist Charles Dover, beside the elephant "Rajah" that he had recently prepared for display, 1936. (Auckland Museum Library, C30455.)

Hauraki Gulf (Ann. Rep. 1934-35). Dover articulated moa skeletons collected by Archey and colleagues. Among tasks he was diverted to during war years was the production of sets of models of tropical fruits for Royal New Zealand Air Force "instructional depots" (Ann. Rep. 1944-45).

Dover was succeeded by Patrick J. O'Brien who had previously been a preparator at Canterbury Museum, and who left to take a position at Otago Museum. O'Brien built a series of small but exquisite dioramas showing life through the ages. In 1964 Leo J. Cappel (1933-) was appointed Preparator. He prepared some mounted birds and study-skins but was engaged mainly in installing dioramas and general displays. In the early 1980s, after Cappel departed, the Preparator's department became a Conservator's department, focussing almost entirely on ethnographic conservation, and the museum was once again without taxidermy skills.

From the mid-1960s until 1987, the museum engaged outside commercial taxidermists (most notably Terry Jenkins at Clevedon; see Table 2 for others) to produce mounts and study-skins. Many of the mounts were good, but these taxidermists lacked museum training and few of the study-skins were well prepared.

During the period 1987-96 the part-time land vertebrates technician (J. Riley) produced well prepared and properly documented study-skins. The few mounts obtained during this time were done commercially.

REGISTRATION AND CATALOGUING

The state of documentation of Auckland Museum's early land vertebrates specimens owes much to the accuracy and meticulousness of Cheeseman. It seems that few specimens were properly labelled before his appointment in 1874. Cheeseman labelled newly acquired specimens but apparently did not begin to number them until 1898.

The earliest surviving departmental register (and numbering system) is the "Blue Book" (see Gill 1984). This lists New Zealand and foreign vertebrates specimens (including human material, but not fish), and was filled out by Cheeseman between 1898, when the book was manufactured, and 1917. Dates of receipt go back to 1870. In the column "When Received", many specimens are marked "In mus. 1874". Specimens were given simple consecutive numbers, and the suffix "V" (for vertebrates) was often used on specimen labels.

A later register (the "Brown Book"), for New Zealand mammals and birds, was filled out by Griffin between 1919 and 1922. The specimens are listed in systematic order, repeating many from the Blue Book. Simple consecutive numbers were used.

In January 1914 a museum-wide accessioning system was established whereby incoming objects received numbers of the form 198/37 (for the 198th object, or group of objects, received in 1937) with details recorded in a central bound register. Many older land vertebrates specimens have such numbers but the system was rarely used for land vertebrates after about 1980.

After Archey's appointment in 1924 the birds were catalogued or re-catalogued by Griffin using 5 x 3 inch ruled library cards. Birds were given AV numbers (e.g. AV 16.25 for the 25th specimen of the sixteenth species), and it was a "double card-index"—one copy was filed numerically and the other alphabetically by the Latin name. Griffin completed the birds in 1925-26. In 1941-42, Turbott extended the card index system to amphibians (AMPH series), reptiles (REP series) and mammals (MAM series)(Ann. Rep. 1941-42).

There was a numerical register of moa bones (with simple consecutive numbers), presumably started by Archey c. 1930, though few entries are in his hand. Cataloguing of moa bones along similar lines to the other birds (using the prefix MOA, e.g. MOA 6.13) was effected in 1966-67 by Wagener (Ann. Rep. 1966-67).

These departmental species numbering systems did not anticipate taxonomic changes. In the 1970s, Reed renumbered numerous specimens to try to accomodate revisions in the new checklist of New Zealand birds (Kinsky 1970), and to extend the cataloguing system to subspecies.

Largely to avoid this problem, the AV, MOA, REP, AMPH and MAM species numbering systems were abandoned in 1983-84 and three simple consecutive numbering series were begun: for birds (prefix B), herpetological specimens (prefix H) and non-cetacean mammals (prefix M). The new systems, starting at 1, were applied to new accessions and, as time permitted, existing specimens were checked and re-numbered (a final re-numbering, it was hoped).

In 1989-90 a computerised catalogue was set up on a stand-alone personal computer using the database software "Advanced Revelation" (Revelation Technologies Inc., Washington State, U.S.A.). By 1990-91 all H and M specimens (then numbering 1,400 and 500 respectively) had been checked, re-numbered and their main details computerised. Birds are still not completely re-numbered but the tally was 9,050 computerised specimens by June 1999.

LOCATION OF THE RESEARCH COLLECTION

Study-skins of birds must surely have been stored away from public view in the Princes Street museum, but all the mounts and perhaps most of the land vertebrates alcoholic collection would have been exhibited. After 40 years the Princes Street building, despite its extensions, was too small, and Cheeseman (1917) lamented the lack of space for new exhibits, existing exhibits "so crowded that they cannot be properly examined by visitors", the few facilities for scientific research, and the lack of storage for duplicate specimens intended for exchange. "Finally, the present workrooms [Fig. 3], though spacious enough, are badly lighted and insufficiently ventilated, and so damp that, with the exception of minerals, no specimens can be stored therein without grave risk of injury" (Cheeseman 1917).

Only with the move to the 1929 building was a separation achieved between research collections in storage and selected specimens on display (Powell 1967: 39). However, new and proper storage furniture was beyond the museum's means. Instead, glass-fronted exhibition cases from the Princes Street building had to be modified as storage cabinets for use by several departments (Ann. Rep. 1927-28: 9). The bird skins were stored on two sizes of wooden trays in recycled cupboards, including old display cases with the glass painted out. (These continued in use until 1991, though supplemented by some skin cabinets, with a third size of wooden tray, built specially c. 1960.)

In the 1929 building the rear (administration) entrance was on the ground floor near the west door of the present extended building. From the 1930s to the 1950s the Assistant Zoologist (later Ornithologist/Entomologist) occupied an office near the administration entrance (E.G. Turbott, pers. comm. 1992). The land vertebrates, and other zoological, collections were stored close by.

After Japan entered the Second World War and the Japanese Army advanced ever closer in New Zealand's direction "... normal routine was subordinated to the packing for removal to places of safety of representative collections ... [including] the whole of the spirit material" (Ann. Rep. 1941-42). Underground storage was provided in lava caves on private property at the foot of Mt Eden in a nearby suburb (E.G. Turbott, pers. comm. 1997). The collections were returned to the museum building in 1943-44 when there was "much to be done to bring the study collections back to their previous order and accessibility", a task hindered by the absence of staff on war service (Ann. Rep. 1943-44).

Until the 1960s, Archey's moa bone collection was stored in a small room over a disused lift

shaft in the north-west corner of the museum (second floor galleries). Archey often worked at night on the bones, sometimes until 2 a.m. (E.G. Turbott, pers. comm. 1997).

Commencement of the 1960 extension necessitated demolition of store-rooms on the ground floor at the rear, and the natural history reference collections were moved to first floor display halls at the front of the building (Ann. Reps. 1956-57, 1957-58). In due course the land vertebrates office and collection store were relocated to the first floor of the new curved administrative block at the rear of the building (south-east corner). The new store was dimly lit by a few incandescent bulbs and calico curtains covered the windows to exclude light. The study-skins were stored in three styles of cabinet each with its own tray-size; the moa bones in wooden trays on wooden racks open to dust.

In 1990-91 the first floor of the administration part of the 1960 extension was refurbished. The land vertebrates collection was moved temporarily to a closed-off portion of the Cheeseman Hall. The new land vertebrates collection store was provided with generous fluorescent lighting, forced air-circulation and internal insulated shutters or venetian blinds on the windows. It was in the same general location as before, but smaller, though its capacity was increased by use of mobile compacting storage units. The 1960s skin cabinets from the old store were reused and new units built to match, thereby standardising on one size of skin-tray. In subsequent years the moa bones were cleaned, and stored in lidded boxes on open steel shelves.

DISPLAYS 1852-1928

DISPLAYS BEFORE 1876

Little can be deduced about land vertebrates exhibits in the three buildings occupied by the museum before 1876. The museum's "Journal" (accessions register; see Park 1999), with its first entry for 3 July 1852, shows that six "glass cases" containing stuffed local birds were donated that year. The species included red-crowned parakeet, New Zealand pigeon, kokako, tui, long-tailed cuckoo, New Zealand kingfisher, fantail and whitehead. The first mammals mentioned in the register were a rat and mole from California (1852); the first herpetological specimen, a native frog (*Leiopelma*) from Coromandel (1853). These were presumably exhibited.

Birds were in demand: "The collection of native birds is a constant source of interest, and the [museum's governing] Council solicits the assistance of the country members [of the Auckland Institute] towards making it as complete as possible" (Ann. Rep. 1872-73: 7). Some of the early exhibits did not last long. When E.B. Dickson became Honorary Curator in 1859, one of his first acts was "the removal and condemnation of several specimens of birds &c., which had decayed beyond all remedy" (Park 1999).

Lists of new accessions in the museum's annual reports suggest that the following were among the objects exhibited before 1876: rock slabs showing moa footprints; moa bones and an articulated moa skeleton; several hundred bird skins from New Zealand, Australia, North America, India and Europe; various nests and eggs of local birds; 20 casts of New Zealand marine reptile fossils; various local and Pacific Islands reptiles in spirit.

DISPLAYS IN THE PRINCES STREET BUILDING

Completion of a purpose-built museum in 1876 (Fig. 1) transformed the possibilities for display (Figs 5-7). There was a single exhibition hall (later called the "Main Hall"), with an upstairs gallery occupying four sides around a central void. Illumination was initially by natural light from a skylight in the ceiling (Fig. 6); gas lighting was installed later. However, growth of the

collections was such that display space was always limited in the Princes Street building despite extensions. There was little storage space for duplicate material and "practically everything in the old museum had to be crammed into the cases in the exhibition galleries" (Powell 1967: 39).

Among the first land vertebrates exhibited in the new museum were foreign birds and mammals exchanged with Otago Museum, New Zealand birds and a skeleton of *Rhea americana* exchanged with Canterbury Museum, and 100 birds from New Ireland and New Britain purchased from the Rev. G. Brown. However, "from the want of new cases and other requisites, it has not been possible to display some of the specimens in as full a manner as could be wished" (Ann. Rep. 1876-77: 10). Photographs of this gallery before adjoining halls were added (Fig. 5; see also Powell 1967: 17) show jumbled and tightly-packed displays, with articulated skeletons, zoological wet specimens in display jars, and deer antlers, all juxtaposed with Maori carvings and plaster copies of classical statues.

By 1886 there were signs of attempts to go beyond individual animals in glass cases, when installation was completed of "a special group, showing the nature of the habitat and special surroundings of the Tuatara Lizard (*Sphenodon*), and a similar one of the Kea Parrot" (Ann. Rep. 1886-87). The first contained four or five tuataras, two sooty shearwaters and a diving petrel (details in "Blue Book"). The reptiles were collected by C.F. Adams on Karewa Island,

Fig. 5. Main Hall, Princes Street building, sometime between 1880 and 1892. The giraffe skeleton competes for attention with plaster copies of classical statues and a carved Maori store house. Stuffed birds are visible in the cases along the wall and the jars on the table-top display unit in the foreground contain natural history specimens in alcohol. (Auckland Museum Library, C27677.)

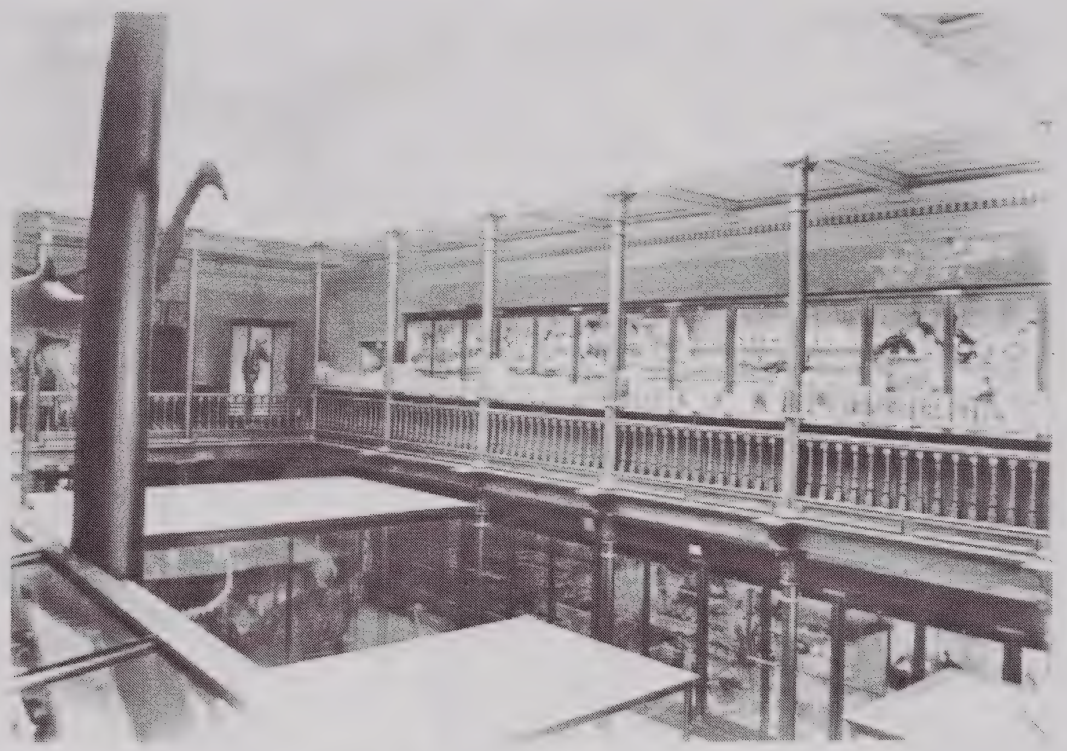


Fig. 6. Upstairs gallery of Main Hall, Princes Street building, 1928. A large skylight in the roof admits natural light. Birds occupy the wall cases of both levels. The ratite display is visible on the ground level. There is a row of specimens in alcohol above the railing, protected by wire mesh from toppling into the void. The horse's head in a case at the far end is that of the racehorse "Carbine". (Auckland Museum Library, C41106.)

Bay of Plenty. The keas, collected in Otago, were depicted attacking a lamb. Wolfe (1998) reproduced a photograph of what is probably the kea display and attributed its painted background to Kennett Watkins, who was associated with the museum at this time. In the same style, a small Auckland Museum display containing a family group of wekas (native rails) with foliage and a painted background is figured by Harper (1900: 99). This is probably the group of two adults and five young collected at Waikato and mounted and presented by F.H. Combes in 1886 ("Blue Book"). The tuatara and weka dioramas are just visible in the background of Fig. 10.

In 1890-91 the Bornean mammals purchased from (and "elegantly mounted" by) C.F. Adams were "placed in a new show case specially erected for them in the centre of the Museum Hall" (Ann. Rep. 1890-91: 7). In October 1892 a gallery ("Ethnological Hall") was opened off the Main Hall and the Maori and other ethnographic collections were moved into it making more room for natural history in the Main Hall. The taxonomic groups of mammals and foreign birds were rearranged and given "printed descriptive labels, accompanied with maps showing their geographical distribution" (Ann. Rep. 1893-94). In the same year a case was set up displaying "complete sets of the leg-bones of several of the species" of moas.

A third hall ("Statue Hall") was opened in October 1897 to contain the plaster copies of

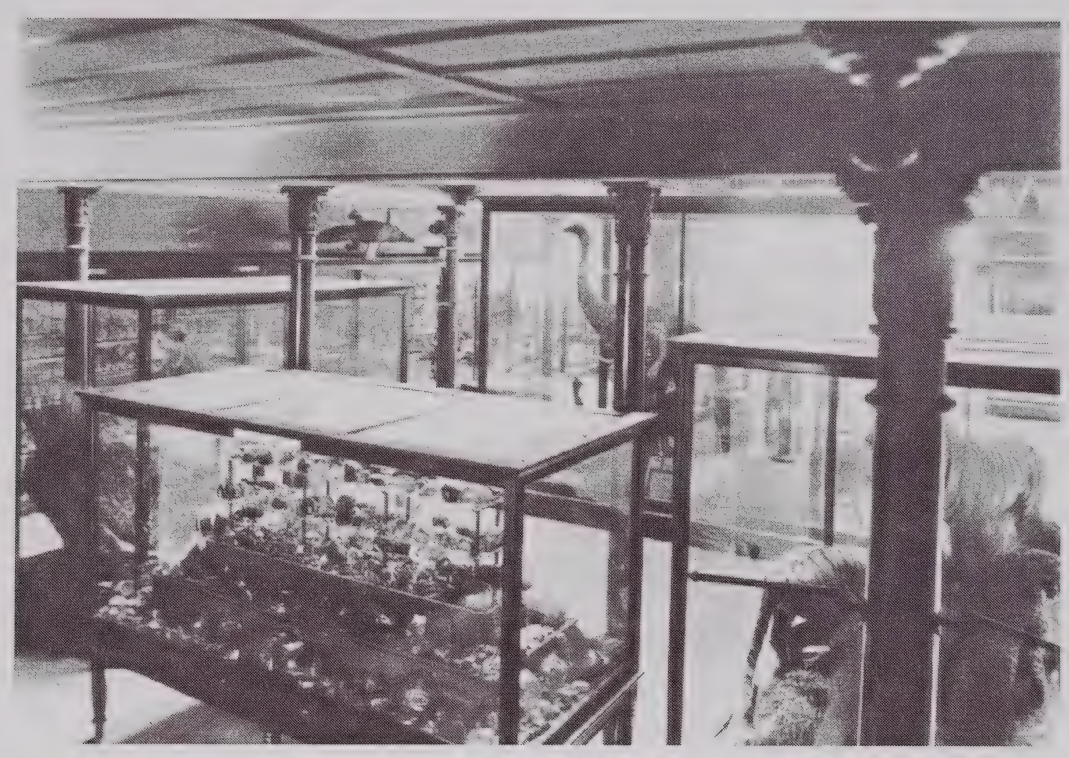


Fig. 7. Ground level of Main Hall, Princes Street building, 1928. The hall is now devoted entirely to natural history. Birds occupy the wall cases to the left. The free-standing cases contain (from left to right): the Gerrard & Sons lion group, kauri gum, the ratite display with moa reconstruction and the Gerrard & Sons tiger/leopard group. (Auckland Museum Library, C41107.)

classical statues, hitherto displayed in the Main Hall, and to serve as a meeting room. This meant that the Main Hall could be devoted entirely to natural history. A plan was devised to fill the centre of the hall progressively with "groups of the larger mammals, arranged in suitable glass cases" (Ann. Rep. 1896-97), additions which "more than any other would enhance the appearance of the Museum, and add to its value as a means of recreation to the general public" (Ann. Rep. 1899-1900).

In 1905 an annex to the Ethnographic Hall was completed for the better accommodation of the Maori collections and to provide for erection of a carved meeting house. In 1904 (or 1905) the first of the long-anticipated large mammal display groups was received, paid for by the Mackechnie bequest. These groups "attracted considerable attention, and are no doubt responsible for a large proportion of the increased number of visitors to the Museum [61,000 for the year]" (Ann. Rep. 1905-06).

To make room for the large plate-glass cases containing the mammal groups, the alcoholic specimens had to be moved upstairs to the gallery. New glass jars were imported and "shelving, with wire guards" provided (Ann. Rep. 1906-07; Fig. 6). In 1909-10 some of the alcoholic specimens were remounted in rectangular glass jars imported from London.

In 1912 there was further progress towards display dioramas when a large group of pied shags (*Phalacrocorax varius*) was prepared with a painted background. An attempt was made to

"show a small colony of the bird in its usual breeding habitat of the upper branches of the pohutukawa tree, the nests, eggs, young, and several examples of both sexes in the adult stage" (Ann. Rep. 1912-13). Two years later a similar group illustrating the spotted shag (*Stictocarbo punctatus*) was installed (Ann. Rep. 1914-15; Fig. 8). This group, containing adults in breeding

Fig. 8. Habitat group of spotted shags *Stictocarbo punctatus* completed 1914-15. (Auckland Museum Library.)

plumage, nests, eggs and chicks was an "exact representation" of a part of the breeding colony at Shag Rock, Firth of Thames. The specimens were collected and mounted by Griffin and the "well-known artist Mr. Kennett Watkins" painted the background. These were followed by cases exhibiting habitat groups of brown kiwis (*Apteryx australis*; Ann. Rep. 1915-16; Fig. 9) and white-fronted terns (*Sterna striata*; Ann. Rep. 1918-19; Fig. 10).

In 1916 the mineral collection was moved, freeing the gallery of the Main Hall to be devoted entirely to New Zealand animals including birds (Ann. Rep. 1916-17). However, space was still limited: "... a glance at the show-cases containing the New Zealand birds will prove that no space remains for further additions. The preparation of special groups illustrating the

Fig. 9. Habitat group of brown kiwis *Apteryx australis* completed 1915-16. (Auckland Museum Library.)

Fig. 10. Habitat group of white-fronted terns *Sterna striata*, c. 1920. This case, completed 1918-19, is in the upstairs gallery of the Main Hall and its label is headed "Group illustrating the breeding habits of the Black-headed Tern (*Sterna frontalis*)." Behind the tern case to the right is visible the kiwi habitat group; the two small cases to the left appear to be the pre-1900 displays of tuataras (below) and wekas (above). (Auckland Museum Library, C27027.)

life history of New Zealand birds, which have proved to be such popular exhibits, has had to be suspended, there being no available space in which to place the show-cases" (Ann. Rep. 1918-19).

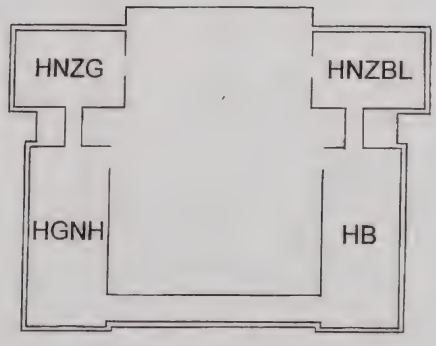
In 1928, the exhibits at Princes Street were dismantled for removal to the new building (Ann. Rep. 1928-29: 7; Powell 1967: 40).

DISPLAYS 1929-1960

HALL OF NEW ZEALAND BIRD LIFE

In 1928 and 1929 the new building in the Domain began to be occupied, and a hall of New Zealand birds was developed in stages in the north-east gallery on the first floor (Figs 11, 13; later the English Furniture Hall, and currently under redevelopment). A display of New Zealand birds was in place there at the museum's opening in November 1929, but the gallery was constantly added to and refined during subsequent decades. The gallery was lit by natural daylight from windows on the north and south walls, and many stuffed birds suffered serious fading as a result.

The pied shag, spotted shag and kiwi habitat groups from Princes Street were installed along the east wall of the gallery (E.G. Turbott, pers. comm. 1998), and new groups were developed. "The plan of displaying native birds in groups representing their natural habitat is



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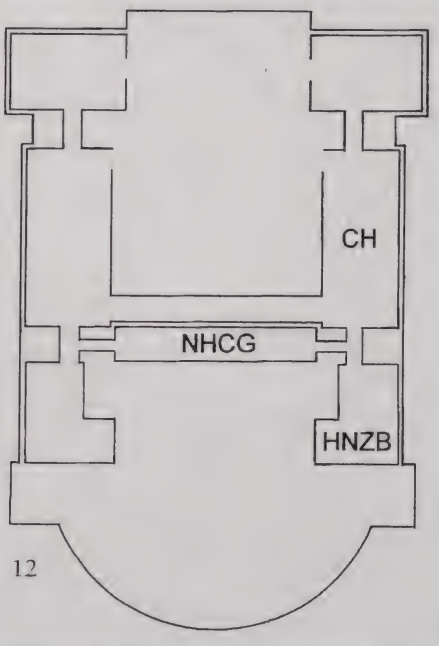

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Figs 11-12. Gallery floor plans (first floor only) showing disposition of galleries containing land vertebrates exhibits, plus the Hall of Botany (HB), renamed Cheeseman Hall (CH) in 1946 (Ann. Rep. 1946-47: 6). North at top of page. 11. 1929 building, for period 1930-60. HNZG = Hall of New Zealand Geology, HNZBL = Hall of New Zealand Bird Life, HGNH = Hall of General Natural History. 12. Extended building, for period 1975-95. NHCG = Natural History Cross Gallery, HNZB = Hall of New Zealand Birds.

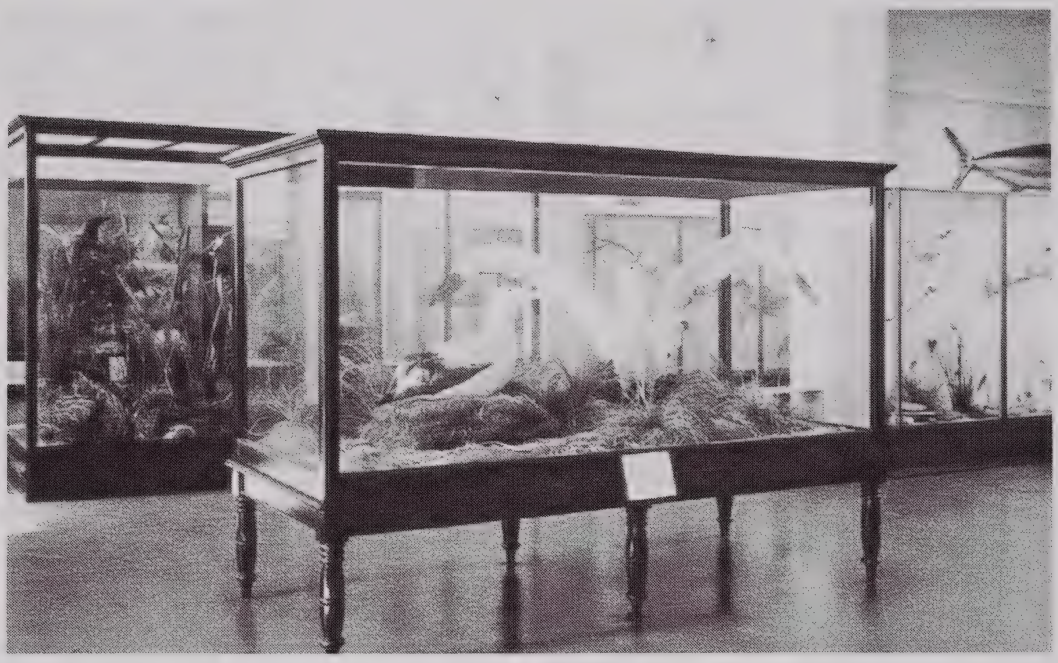

Fig. 13. General view of 1929 Bird Hall, c. 1960. "A new habitat group, illustrating the courtship and nuptial display of the Wandering Albatross, has now been placed centrally in the New Zealand Bird Hall" (Ann. Rep. 1932-33: 19). Photo: E.G. Turbott.

being followed as far as the size of the show cases will allow. A group of gannets has been completed ..." (Ann. Rep. 1930-31).

Many of the specimens for the new displays were shot locally by Falla, and prepared by Dover—thus the museum was able to display many fresh and well-prepared specimens, which have been used again in later displays. In 1931-32 subantarctic and antarctic habitat groups were added, as well as 50 further individual mounted birds, some of them replacing faded specimens.

In 1933-34 an introductory case was added "in four sections to illustrate bird structure, flight, migration, and flightlessness" (Ann. Rep. 1933-34). Also that year a habitat group of keas was completed, "the accessory vegetation having been collected by Mr W. Martin from kea country in Marlborough". In 1937-38 was added "a habitat group of New Zealand inland water birds" mounted by Dover. In new displays of terns, gulls, albatrosses and petrels, a "satisfactory result" was obtained from "a formal arrangement against a uniform background with a rock or sand base" (Ann. Rep. 1938-39). Six new cases were finished in 1939-40 illustrating forest birds, pasture birds, birds of waste and cultivated land, some taxonomic groups and introduced birds. In 1940-41, cases of parrots, penguins and kiwis were finished, so completing the general displays of New Zealand birds. In the same year, there were experiments with artificial lighting in the deeper cases containing habitat displays (Ann. Rep. 1940-41). Type-written labels were progressively replaced with printed labels in more legible type (Ann. Rep. 1946-47).

In about 1950 the power supply for displays was changed from direct to alternating current permitting use of fluorescent lighting for the first time (Ann. Rep. 1951-52: 13). In 1950-51 "a

newly arranged habitat group of godwits and other waders" was installed with a new painted background (Ann. Rep. 1950-51). This was a "special display project" using internal strip lighting to illuminate the case. In 1952-53 some "formal" cases in the gallery were replaced by six new habitat groups, again illuminated by strip lighting, and artificial lighting was extended to other cases. "An effective representation of the habitat in this shallow type of case proved a difficult problem, but has been overcome by Mr. McCaw in the blending of his painted background and foreground material on a gently rising base" (Ann. Rep. 1952-53).

The 1929 bird gallery remained intact until about 1969 when work began on a new bird hall elsewhere on the same floor.

HALL OF GENERAL NATURAL HISTORY

The 1929 building contained a Hall of General (or Foreign) Natural History, in the largest gallery on the west side of the first floor (Fig. 11). The display-groups of foreign mammals from the Princes Street building were re-erected here (Ann. Rep. 1928-29: 14). Dover mounted

Fig. 14. Moa display in the Hall of New Zealand Geology, 1937. (Auckland Museum Library, C41105).

a kudu and wildebeeste that died at Auckland Zoo, and "mounted in a habitat case a fine pair of introduced [red] deer" (Ann. Rep. 1932-33: 15). In this gallery were displayed mounted heads of Canadian mammals (Ann. Rep. 1934-35) and the museum's large collection of foreign mounted birds. The annual report for 1935-36 refers to a new arrangement of birds of paradise in this gallery and a "natural habitat group of pheasants". The Indian elephant "Rajah", mounted by Dover (Fig. 4), was exhibited in this gallery from October 1936. In 1942-43 a habitat group of monkeys was installed including four new specimens mounted by Dover. A display of Australian animals from Kawau Island was also installed (Ann. Rep. 1947-48).

With the rearrangements following from the additional galleries in the 1960 extension, the Hall of General Natural History became the Geology Hall, and is currently the Oceans Gallery.

HALL OF NEW ZEALAND GEOLOGY

This gallery on the north-west corner of the first floor (Fig. 11) held a display of moas (Fig. 14) and of foreign ratite birds. After 1960 it became the Maritime Hall, and is now the Human Impacts Gallery.

DISPLAYS AFTER THE 1960 EXTENSION

HALL OF NEW ZEALAND BIRDS

Although the extension to the 1929 building was completed in 1960, work did not begin on the new bird hall in the extension (first floor galleries south-east; Figs 12, 15-17) until about 1969 with opening in 1972. Donations for the fitting out of the new bird gallery were received from the Sir John Logan Campbell Trust ($14,300) and the Auckland Savings Bank ($7,000) (Ann. Reps. 1971-72, 1972-73, 1973-74). Turbott, then Director, planned the contents and wrote the labels. Cappel, the museum's Preparator, helped develop the floor plan and produced the identification displays and dioramas. Windows in the gallery were covered and illumination was by fluorescent lighting.

The first item to be completed was the wandering albatross diorama at the entrance to the hall (Fig. 15), installed by 1969-70, and re-using birds from a 1933 display (Fig. 13). The main part of the gallery (300 m^2) was opened to the public in April 1972 by Sir Arthur Galsworthy, British High Commissioner to New Zealand. At opening, six of the dioramas and three cases remained to be finished. The Little Barrier diorama (Figs 15, 16) was completed in December 1974, and the last diorama (gannet nesting group) in 1975-76.

When complete, the 1972 bird hall contained some 470 mounted birds. There were four main sections dealing respectively with sea birds, forest birds, birds of town and country (plus extinct birds), and shore and swamp birds (Fig. 15). For each of the main taxonomic groups (penguins, oceanic birds, shags, gulls and terns, ducks, waders) and habitats (forest, town and country, mountain and open country, freshwaters) there was an "identification series" comprising mounted examples of nearly every New Zealand species. These were grouped mostly on painted supports against plain painted backgrounds.

Spread throughout the hall were 12 dioramas both large and small (Fig. 15). Most had fully domed backdrops. The hall's "feature diorama" showed forest birds on a dry kauri ridge on Little Barrier Island. It comprised the carefully modelled ridge features, including representations of tree trunks and dense foliage, in front of a large painted plaster dome. Looking to the left past the birds and foliage could be seen the Hen and Chicken Islands on the horizon. In the wader deep dome the careful painting of the curved backdrop created the illusion, in a confined

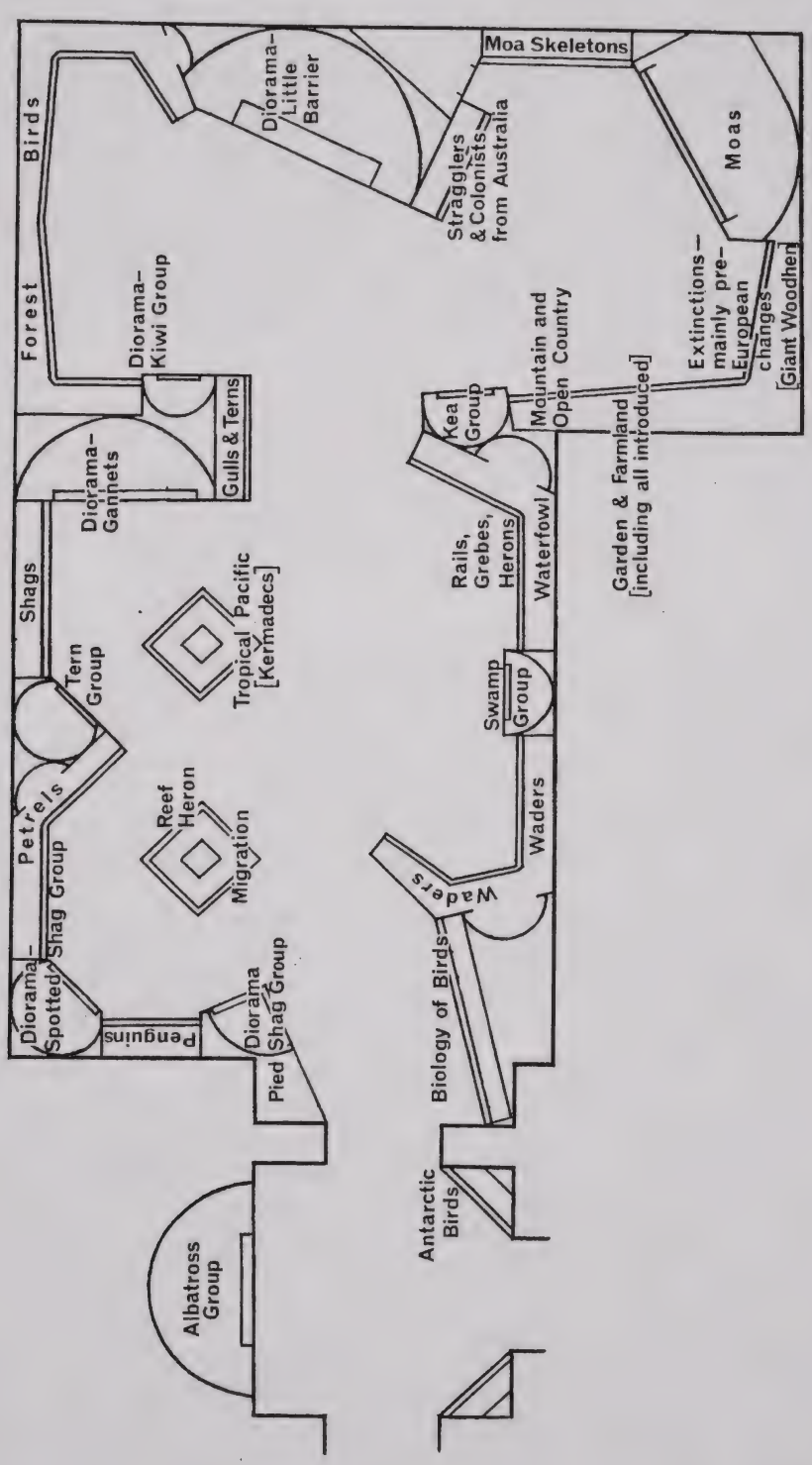

Fig.15. Floor plan of Hall of New Zealand Birds showing disposition of exhibits, 1972-96. Diagram: S. Ensor.

space, of a limitless horizon. An innovation by Cappel in the swamp scene inset (back-to-back with the kea group, Fig. 15) was painted foliage on a fine gauze screen to create a middle-distance and an illusory depth of field (Ann. Rep. 1972-73).

Most of the dioramas—albatross, pied shag, spotted shag, tern, kiwi, kea, swamp scene inset, and swamp (inland waters) group—were modifications of "habitat groups" from the 1929 bird hall. The gannet colony, Little Barrier diorama, backdrop to the old moa reconstruction (Fig. 17) and wader deep dome were new. Most of the mounted birds throughout the hall were reused from previous displays. At opening, the white-fronted tern diorama had sound effects—tape-recorded bird calls activated by push-button. Sound was later added to the kiwi and Little Barrier dioramas.

The cases in the 1972 bird hall had steel-framed plate glass fronts with wooden floors, backs and partitions. The glass fronts were hinged above for access. Fluorescent strip lighting above each case was concealed behind a hinged wooden access-flap. Labels were hand-written by a staff artist, with main headings in cork lettering. The displays were broken up in 1996, and the gallery redeveloped for collection storage.

NATURAL HISTORY CROSS GALLERY

A long, narrow gallery linking east and west display galleries on the first floor of the 1960 extension (Fig. 12) was developed as a hall of foreign natural history in the 1960s. The east wing contained most of the museum's old collection of foreign birds mounted on individual bases (Fig. 18). These were grouped taxonomically in bronze-framed glass cases (manufactured

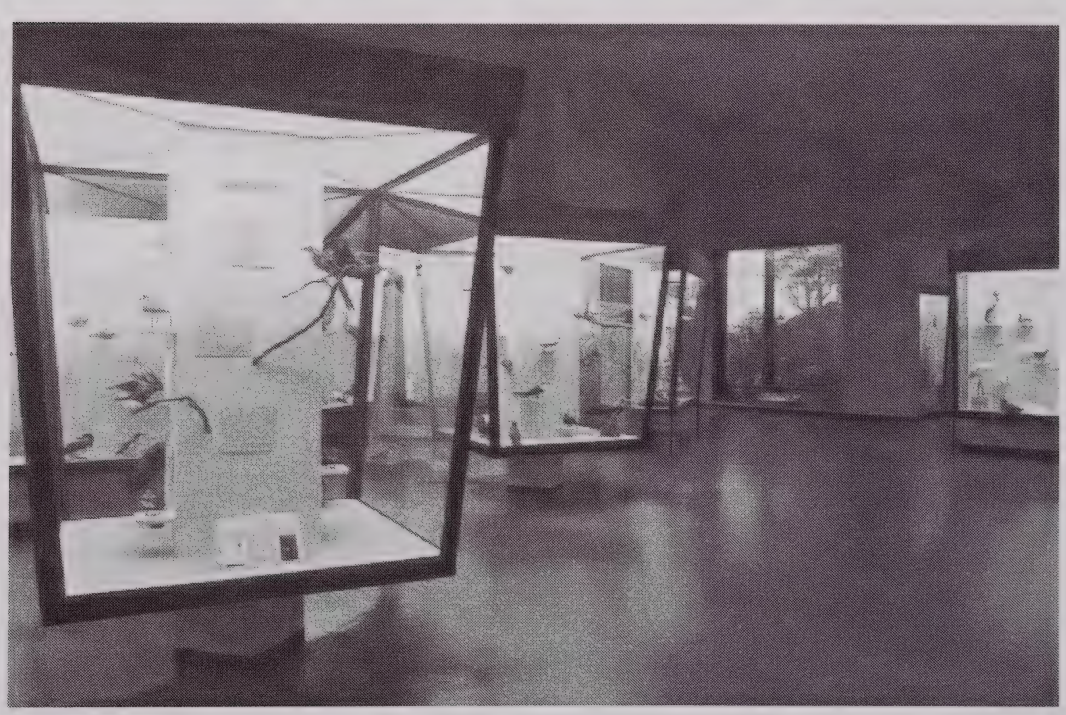

Fig. 16. Hall of New Zealand Birds, 1996. View from near the entrance looking towards the Little Barrier diorama in the distance. Two free-standing cases on the left deal with migration and subtropical seabirds. Photo: K. Pfeiffer.

Fig. 17. Hall of New Zealand Birds, showing the moa reconstruction, a group of four moa skeletons and a case of other extinct birds, 1996. Photo: K. Pfeiffer.

Fig. 18. Foreign birds in the Natural History Cross Gallery, 1994. The birds of paradise in the foreground are a 1972 rearrangement in an older case; the other birds are in recycled brass cases from the original 1929 displays. Photo: K. Pfeiffer.

by A. Edmonds & Co. Ltd. of London and Birmingham) recycled from the original 1929 displays. The west wing contained foreign mammals mostly regrouped from earlier displays, in particular the 1906 musk oxen and polar bear group, and later groups containing primates, kudu and gnu, red deer, and seals. Two cases developed after 1969 showed representative foreign mammals and mammals introduced to New Zealand. Between the two wings an elevated area held the Hemingway collection of foreign insects. The gallery was closed in 1994 and redeveloped as a natural history "discovery centre" for children.

THE GREAT EXCHANGES, 1875-1905

Cheeseman corresponded prolifically with natural historians and collectors overseas, often seeking to exchange specimens (see Goulding 1974, 1975 and 1976 for details of botanical exchanges). "Arrangements have been made by the Curator for interchanges with most of the principal European Museums ... From the Paris Museum a first consignment has already arrived, comprising an extensive series of mammals, bird skins, &c. ... [and a] collection of bird skins has also been received in exchange from Mr D. S. Bryant, of San Francisco" (Ann. Rep. 1877-78: 10). In the 1883-84 year lack of storage space forced Cheeseman to "suspend the usual exchanges with foreign museums".

Cheeseman could offer for exchange skins of native New Zealand birds, including South Island species like yellowheads. Particularly large numbers of kiwi specimens were sent; also moa bones, tuataras and ethnographic items. In the 1878-79 fiscal year, the museum purchased 200 New Zealand bird "skins", "partly for exchange with foreign Museums" (Ann. Rep. 1878-79: 9). A gift of reptile specimens from Mr Parsons of Tonga was especially valuable "from the large number of duplicate specimens which will be useful for exchanges" (Ann. Rep. 1878-79: 10).

Exchanges of land vertebrates were made with New Zealand and foreign museums and with foreign dealers in natural history specimens (e.g. Garnier and Ward; see Appendix 1). The main exchanges took place during some 30 years between about 1875 and 1905. The major exchange partners in terms of numbers of land vertebrates specimens received were the Florence Museum (at least 635 specimens received), the Smithsonian (at least 343 specimens) and Dr Garnier (at least 326 specimens). Closer to home, more than 100 specimens each were received from the Australian Museum (Sydney) and Otago Museum (Dunedin).

An example of an exchange is that in 1881 with the natural history dealer H.A. Ward of Rochester, U.S.A., who in the course of his business helped enrich U.S. museums during the period of rapid development of popular museums in the 1870s and 1880s (Kohlstedt 1980). The stimulus for the exchange was presumably a visit to Auckland by Ward (Ann. Rep. 1881-82: 7).

Ward gave or sent Cheeseman a hand-written note dated 28 March 1881:

> I have this day received from Mr. T.F. Cheesman [*sic*] various specimens of Natural History valued at £55.10.0 (including 12 skins of Apteryx still to be sent me.) In exchange for these specimens I hereby agree to send to the Auckland Institute and Museum a certain series of Casts of Celebrated Fossils ammounting [*sic*] — [illegible] catalogue prices to $268.25 = £55.10.0. (List signed by me.) These casts I will if practicable send from Melbourne (Australia) about one month hence. Otherwise they will be sent from New York as soon after June 1st '81 as a ship may be leaving for Auckland. In either event the entire series of specimens will be carefully packed at my expense and delivered to the ship which is to bring them. [Signed] Henry A. Ward.

A list in Cheeseman's hand shows what he gave to Ward: 24 New Zealand bird skins; 17 kiwi skins, skeletons or eggs; a "moa track" (i.e. fossilised footprint/s); four geckos; a seal skull;

a whale skull; a hornbill; 15 bird skins and seven ethnographic items from Melanesia ("duplicates from Mr Goldie's New Guinea collections"); 47 Maori items (mainly stone implements); a specimen of ? (illegible); and a specimen of nickel.

An inventory in Cheeseman's writing, signed by Ward, shows the plaster casts that Ward sent in return: six skulls or framed slabs (showing exposed fossils *in situ*) of fossilised mammals (including skulls of Neanderthal man, *Mastodon* and *Diprotodon*); a tarsometatarsus and egg of the elephant bird (*Aepyornis*); seven framed slabs of fossilised reptiles (including ichthyosaurs and plesiosaurs); six framed slabs of fossilised fishes; nine invertebrate specimens; and examples of 96 species of Foraminifera. "The casts have lately arrived from New York, and the greater portion have just been placed in the Museum" (Ann. Rep. 1881-82: 7).

SPECTACULAR DISPLAY OBJECTS

MAMMALS OF THE MACKECHNIE BEQUEST

In 1902 the museum received a bequest from Mr E.A. Mackechnie, which included £500 for "procuring groups of the larger mammals and the necessary show-cases" (Cheeseman 1917). Four mammal groups were obtained, all prepared by Gerrard and Sons of London. The first group (male and female lion and four cubs) was placed in the Main Hall as soon as it arrived from England (Ann. Rep. 1904-05). A second group (male and female tigers and a leopard) followed in 1905 (Ann. Rep. 1905-06). The Arctic Group (polar bear and three musk oxen, male, female and young) arrived in 1906. This last group (and possibly others) was shipped to New Zealand free of charge by the Shaw Savill Line. The fourth and final group arrived in 1907—a group of South African mammals comprising a zebra, a waterbuck, a springbok and an impala (Ann. Rep. 1907-08).

All the groups were presumably moved to the 1929 building, but they were eventually broken up except for the Arctic Group. This was displayed in the Natural History Cross Gallery from the 1960s to 1994, then in the Cheeseman Hall where it remained on exhibition until 1997, after which it was stored off-site.

MOA RECONSTRUCTION AND GIANT MOA SKELETON

In 1912 a successful public appeal was made to raise £700 for the two-fold aim of purchasing some Maori carvings and setting up a plate-glass case containing a moa "restoration", a large moa skeleton, and mounted examples of various living ratites (Ann. Rep. 1911-12). In 1912 an articulated skeleton (comprising plaster casts) of the largest moa *Dinornis giganteus* (skeleton shown at rear of Fig. 14) was received from Mr Damon, an English dealer. L.T. Griffin built a reconstruction of the same species using emu feathers (Figs 14, 17). Both were 3 m tall. The ratite display was finished in 1913 and placed in the centre of the Main Hall (visible in Fig. 7). It was inaugurated by a conversazione on the evening of 8 October 1913 attended by about 550 people.

In the 1929 building, the moa reconstruction and giant moa skeleton were exhibited in the Hall of New Zealand Geology (Fig. 14). Both were prominent features of the 1972 Bird Hall (Fig. 17), the moa exhibits forming the museum's second most popular attraction after the Maori displays. The reconstruction was moved to the Special Exhibition Hall on the ground floor for a temporary exhibition ("Kiwi and Moa: Flightless Wonders") in the summer of 1991-92. With the closure of the Bird Hall in March 1996, the large skeleton was stored and the

reconstruction was moved to open display in the Cheeseman Hall. (In September 1997 the reconstruction was stored, and from early 1999 it was displayed in its own case as a major attraction in the new Origins Gallery in the Cheeseman Hall. The skeleton was displayed in late 1999 in an alcove near the west front stairs.)

"RAJAH" THE ELEPHANT

In March 1936 a young bull Asiatic elephant (*Elephas maximus*) named "Rajah" was shot at the Auckland Zoo because he was becoming hard to handle. He was 19 years old and had been bought for £100 in 1930 from Hobart Zoo. The skin was prepared for mounting at Auckland Museum by Dover—one of the biggest taxidermy jobs ever undertaken in New Zealand (Fig. 4). "Visitors were given opportunities of witnessing the various stages in this undertaking, which aroused almost as much interest as the complete preparation" (Ann. Rep. 1936-37). The prepared specimen was exhibited in October 1936 in the Hall of General Natural History. "Rajah" remained in the centre of this gallery until 1992 when he was moved to the ground floor and exhibited on a raised platform in the foyer. In March 1994 "Rajah" was removed to an off-site store after 58 years of constant exhibition. (In 1999, "Rajah" was brought back to the museum to be restored for display in a social history gallery.)

EARLIEST SPECIMENS

BIRDS

The oldest bird in the Auckland Museum collection is a study-skin of a grasshopper warbler *Locustella naevia* (B7633) collected in England in 1844, but obviously obtained by the museum later. The oldest New Zealand ornithological specimens are fragments of moa eggshell collected

Fig. 19. Mounted specimen of the extinct New Zealand quail *Coturnix novaezelandiae*, prepared by I. St John of Nelson and received by the museum 1856-57. It is one of the museum's earliest surviving acquisitions. Photo: B. Gill.

by W.B.D. Mantell in 1847-8 (B4013) and 1852 (B4014), but it is not known when the museum received them.

The museum's oldest surviving stuffed birds are those bought from the collector and taxidermist I. St John of Nelson in 1856-57, which are among the very few items known to have been in the museum's collection before its move to the Princes Street building. The museum's "Journal" lists 35 birds in two lots received on 8 September and 12 December 1856. A third consignment received on 16 January 1857 is not itemised. Only 13 St John birds survived to be registered by Cheeseman in the "Blue Book". Of these, five can be identified in the collection today: relaxed mount of New Zealand falcon (B2521, Blue Book 837); mount of New Zealand quail (B4106, Blue Book 842, Fig. 19); mount of orange-fronted parakeet *Cyanoramphus malherbi (= auriceps)* (B4179, Blue Book 815 or 816); relaxed mount of yellowhead (B4852, Blue Book 766 or 767); and mount of New Zealand robin (B8480, Blue Book 748). A possible sixth St John bird is B7869, relaxed mount of *Cyanoramphus malherbi.*

The next oldest surviving New Zealand birds, received in 1870, are a mounted brown kiwi (B8590) and a mounted New Zealand snipe *Coenocorypha aucklandica* (AV 1389.1).

REPTILES AND AMPHIBIANS

The oldest herpetological specimen is a shore skink *Oligosoma smithi* in alcohol (H613) collected in the Bay of Islands in 1841 by the Royal Navy Antarctic Expedition (*Erebus* and *Terror*). It was obtained by exchange from the British Museum (Natural History) in 1983.

A sea snake *Pelamis platurus* that came ashore alive c. 1868 just south of Port Waikato is possibly H335. Cheeseman (1908) described its capture:

> It was discovered by some Maoris, who were naturally afraid to touch it, but with some little trouble managed to guide it into a discarded Wellington boot. They then took it to Mr. Dashwood, the proprietor of the store at Port Waikato, who secured the specimen, sacrificing the better part of a bottle of whisky for its preservation. A few months later he gave it to the late Captain Hutton, by whom it was presented to the Auckland Museum, where it still exists. Many years after the capture of the specimen the late Mr. Dashwood gave me a graphic account of the consternation which its arrival created among the Maoris, who were inclined to regard it as a juvenile *taniwha* [mythical monster].

No tuatara or lizard specimens survive in the collection from the 1800s. The oldest specimen exchanged before 1900 is a skeleton of *Python sebae* (H644) received from the Paris Natural History Museum in 1878.

MAMMALS

Antelope bones (M362) from Ethiopia collected in 1870 and received in 1887 are the museum's earliest surviving mammalian specimen. The oldest New Zealand mammals are a long-tailed bat *Chalinolobus tuberculatus* (M59) and lesser short-tailed bat *Mystacina tuberculata* (M15), purchased together in 1890.

DISCUSSION

Two dates, 1876 and 1929, stand out as major milestones in the early development of Auckland Museum and its land vertebrates collection. In 1876, two years after the appointment of Thomas Cheeseman, the museum at last settled into a large purpose-built building, and could develop attractive exhibits and expand the collection. During the Cheeseman era of almost 50 years the

museum became established as "one of the chief scientific institutions in New Zealand" (Cheeseman 1917), and Cheeseman promoted exhibits, collections and research with vigour.

The move to a new building in 1929 signalled the further expansion of the museum on all fronts. There was room to separate objects for exhibition from those to be held in storage for reference only. The complement of staff increased beyond a curator and assistant so that collections began to be curated by specialists—in 1930 there was a Conchologist/Palaeontologist (A.W.B. Powell), a Botanist (Lucy Cranwell) and an Honorary Ornithologist (R.A. Falla). Also in 1930 the museum began annual publication of a scholarly periodical, *Records of the Auckland Institute and Museum* (see Furey & Gill 1997).

Auckland Museum has always been funded predominantly by the local community. The Princes Street building, 1929 building and 1960 extension, were all largely paid for by public subscription, with limited contributions from the New Zealand Government (see Powell 1967). A characteristic of Auckland Museum has been the continuous strong support by local citizens, particularly members of the "Institute", which has functioned, among other things, as a "Friends of the Museum" group since 1867. Gifts of objects for the collection, and small monetary donations have been numerous. However, a dearth of major private benefactors, and minimal financial support from the New Zealand Government, meant that Auckland Museum has been chronically short of funds for much of its existence. To give one example of the impact of this on the land vertebrates collection: apart from some small waist-high cabinets with drawers at each end, that may have been used for bird study-skins before 1929, no proper skin cabinets were provided for the bird collection until about 1960, and then only as an adjunct to inferior cabinets that were not replaced until 1991.

Further to the question of government support, it is worth noting that the land vertebrates collection at Auckland Museum, as at other New Zealand museums, never benefited from systematic government-funded collecting as occurred with official faunal surveys in countries like the United States of America and India. An exception perhaps is the bird collection of the B.A.N.Z.A.R. Expedition (Appendix 1). Instead, some of the finest sub-collections of land vertebrates at Auckland Museum were gifts from individuals who had collected at their own expense—the Buddle and McLean collections of New Zealand bird eggs, and the Hughes, McGregor, Munro and Pycroft foreign collections (Appendix 1).

For small colonial museums with limited funds, the great exchanges in the last quarter of the 1800s were a practical way of widening the scope of the collections. New Zealand museums, with a novel fauna and desirable Maori ethnographic items at hand, were ideally placed to attract good exchanges, and Auckland Museum seems to have had some success with exchanges for land vertebrates. However, needs and wishes were seldom easy to meet, as shown by the problems associated with Canterbury Museum's exchanges, including a world-wide glut of kiwi specimens and moa bones (Sheets-Pyenson 1988). The aim in acquiring foreign natural history specimens was to build up a "type" collection illustrating the world's main animal and plant groups. By exhibiting exotic species from around the world, Cheeseman was contributing to the entertainment and education of the people of Auckland at a time when there was no local zoo and books illustrated in colour were scarce.

Cheeseman must have welcomed the occasional visit to Auckland by foreign experts as a source of new ideas complementary to his prolific correspondence with curators and scientists around the world. One such foreign expert was the entrepreneurial American collector and dealer Henry Ward, who visited Auckland and in 1881 exchanged specimens with the museum. Ward was always ready to give "advice on preparation, preservation and presentation to inexperienced directors of understaffed new museums" (Kohlstedt 1980). His assistance to Auckland Museum continued after his visit—about 1884 he acted as the museum's agent in

the selection of an American taxidermist prepared to emigrate to Auckland.

Ward's visit may also have been influential in the genesis of Auckland Museum's first habitat displays—the small tuatara, kea and weka exhibits of 1886. In United States museums, the move towards displaying natural history specimens in their natural contexts in "habitat groups" began in about 1879 following earlier precedents in Britain (Kohlstedt 1980). Whether influenced by developments in Britain or America, the trend continued at Auckland Museum with the large shag display of 1912, and others that followed soon after. The zenith in natural history diorama-building at Auckland was reached with the large dome-backed dioramas central to the 1972 Bird Hall, which delighted the public for 24 years.

Since the closure of this gallery in 1996 a new chapter has unfolded. All of Auckland Museum's natural history galleries have been redeveloped with a themed approach stressing time sequences and habitats. As in the past, land vertebrates specimens continue to be of central importance to many of the new exhibits.

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APPENDIX 1. Major or interesting accessions of groups of land vertebrates specimens, Auckland Museum, 1876-1995, arranged alphabetically by source. Most were acquired by purchase, exchange or donation. Some notable collections by staff members during their employment are included. Compiled largely from accessions lists in the museum's annual reports.

ADAMS, C.F. (of Illinois, U.S.A.): "Skins of Orang-Utan, Proboscis Monkey, Lemur, Sun Bear, Pigmy Deer, Argus Pheasant, and other Bornean Animals", purchased (Ann. Rep. 1888-89). "Collection of Bornean animals, including stuffed specimens of the following species: Orang-Utan ... [11 others]", purchased (Ann. Rep. 1890-91). "Collection of North American Batrachians [6 species]", exchanged (Ann. Rep. 1890-91).

AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK: Study-skins of Western Samoan birds from the Whitney South Sea Expedition, 1924. A condition of the collecting permit for Western Samoa issued by the New Zealand Government (the colonial power) was that a named specimen of all birds collected be submitted; 47 specimens came to Auckland Museum. Also, specimens of three species of petrels from Bounty Islands received 1926-27 (Ann. Rep.).

ARCHEY, G. (of the museum staff): Moa bones (collected with assistance from Sir Frank Mappin, A.T. Pycroft and Sir Carrick Robertson) from limestone caves in the Waikaremoana and King Country areas and from sand-dunes at Doubtless Bay, 1930-40.

AUCKLAND ZOO: Birds, mammals and reptiles from Auckland Zoological Park, and before that "Onehunga Zoo", 1912-1960.

AUSTRALIAN MUSEUM, SYDNEY: "103 Australian Bird Skins", exchanged (Ann. Rep. 1878-79).

B.A.N.Z.A.R. EXPEDITION: Bird skins, spirit specimens and eggs from Antarctica obtained by the British, Australian, New Zealand Antarctic Research Expedition collected by R.A. Falla (of the museum staff), 1929-31.

BELL, R.: Bird specimens collected by Roy Bell on the Kermadec Islands. "103 Bird-skins" including "petrels and other oceanic birds", purchased (Ann. Rep. 1911-12).

BELL, T.: Bird specimens collected by T. Bell on the Kermadec Islands. "Skins of *Phaethon* and *Procellaria* sp., Collection of Birds' Eggs" (Ann. Rep. 1888-89). "Petrels and Land Rail" (Ann. Rep. 1889-90). "18 Bird Skins" (Ann. Rep. 1890-91).

BROWN, Rev G.: Bird mounts from New Britain, New Ireland, Rotuma and Samoa. "100 bird skins from New Britain and New Ireland: Purchased by special subscription", also "12 Marsupials, bats, &c. ... reptiles, &c.; eggs of the cassowary, megapode, &c." (Ann. Rep. 1876-77). "10 Bird Skins from the Solomon Islands" (Ann. Rep. 1882-83). George Brown was a missionary, and many of his specimens of Melanesian mammals and birds went to the British Museum (Various Authors 1906).

BRYANT, D.S. (of San Francisco): "25 Californian Bird Skins", exchanged (Ann. Rep. 1877-78).

BUDDLE, G.A. (of the museum staff): Collection of 800 eggs and 1,200 photographic negatives of New Zealand birds presented 1931-32, or received posthumously in 1951.

CANTERBURY MUSEUM, CHRISTCHURCH: "Specimen of the White Crane" (Ann. Rep. 1873-74). New Zealand bird skins, casts of *Harpagornis* bones, a skeleton of *Rhea americana*, exchanged (Ann. Rep. 1876-77). "Skeleton of African Ostrich, specimens from the Bone Caves of Central Europe", exchanged (Ann. Rep. 1878-79). "Skeleton of Giraffe" (Ann. Rep. 1879-80). "96 Bird Skins, 10 Skeletons",

exchanged (Ann. Rep. 1881-82). "Bones of Cave Bear", exchanged (Ann. Rep. 1890-91). "Skin of Laughing Owl", exchanged (Ann. Rep. 1891-92). "Moa Skeleton; Moa Feathers", exchanged (Ann. Rep. 1892-93). "Specimen of *Phalacrocorax Ranfurlyi*", exchanged (Ann. Rep. 1903-04).

CHOLMONDELY, Hon. R. (of London): "21 Skins of Trogons and other birds", exchanged (Ann. Rep. 1882-83).

COLONIAL MUSEUM, WELLINGTON (now Museum of New Zealand): Numerous specimens received from "The Director of the Colonial Museum", including the following more notable ones. "Skeleton of Apteryx Australis" (Ann. Rep. 1870-71). "20 Casts N.Z. [Mesozoic marine] Reptilian Remains", model eggs of moa and kiwi, "2 Skins Xenicus Stokesii", egg or eggs of *Coturnix novaezelandiae* (Ann. Rep. 1871-72).

COMBES, F.H.: "25 New Zealand Birdskins" (Ann. Rep. 1880-81). Young kangaroos and opossums in spirits (Ann. Rep. 1881-82). "New Zealand Bird Skins; Skin of White Swan" (Ann. Rep. 1882-83). "New Zealand Bird-skins" (Ann. Rep. 1883-84). "Skins of Kangaroo, Opossum, and Wallaby; 13 New Zealand Bird Skins" (Ann. Rep. 1890-91). "12 New Zealand Bird-skins" (Ann. Rep. 1892-93). "3 Young of Harrier Hawk" (Ann. Rep. 1927-28). "Extensive collection of N.Z. and foreign Birds, mounted and Cabinet-skins" (Ann. Rep. 1930-31).

CRABTREE, T. (of Napier): Exposed and partly exposed fossils of Late Cretaceous marine reptiles from Mangahouanga, purchased 1989.

DANNEFAERD, S.: Bird skins from the Chatham Islands, including those of *Bowdleria rufescens*, purchased: 10 (Ann. Rep. 1911-12), 19 (Ann. Rep. 1915-16), number not stated (Ann. Rep. 1918-19).

FINSCH, Dr O. (of Germany): "24 Skins of Humming Birds", presented (Ann. Rep. 1881-82).

FLORENCE MUSEUM (Imperial Museum of Natural History), ITALY: "392 Skins of Birds and Mammals", "European and exotic", exchanged (Ann. Rep. 1881-82). "160 Bird-skins, 25 Mammals", plus 30 "alcoholic specimens of reptiles", exchanged (Ann. Rep. 1888-89). "Thirteen Mammals, set up; fifteen Bird Skins", exchanged (Ann. Rep. 1891-92).

GARNIER, Dr (of Lucknow, Ontario, Canada): "150 Bird Skins, 8 Mammals, 28 Reptiles" from North America, exchanged (Ann. Rep. 1881-82). "140 Skins of Mammals, Birds and Reptiles", exchanged (Ann. Rep. 1882-83).

GENEVA MUSEUM (Muséum d'Histoire Naturelle), SWITZERLAND: "60 European Bird Skins, collection of European Birds' Eggs", exchanged (Ann Rep. 1878-79). "12 Mammals, 52 Birdskins", exchanged (Ann. Rep. 1880-81).

GILLIES, T.B. (of Auckland) and eight others: "100 Queensland Bird Skins" procured by "special subscription" (Ann. Rep. 1871-72).

GOLDIE, A.: Ten marsupials and 110 bird skins from New Guinea, purchased (Ann. Rep. 1879-80). Andrew Goldie was a Scottish naturalist who was based at Port Moresby c. 1880, where he owned the store. He discovered gold near the settlement in 1878 (Souter 1963: 44-5).

HUGHES, A.R.: Bird study-skins from Sri Lanka, presented. "Collection of Bird Skins from India and Ceylon" (Ann. Rep. 1930-31). "85 birdskins" (Ann. Rep. 1931-32). A.R. Hughes was honorary New Zealand Government Agent in Colombo.

HUNT, G.: 130 New Caledonian lizards, presented 1994-95.

KEMP, R. (of Long Sutton, England): "Series of Skins of Small English Mammals" (Ann. Rep. 1909-10).

KINLOCH, D.I.: 100 wallaby skulls collected on Kawau Island, 1968-72, presented by Auckland University 1992.

McGREGOR, W.R.: 334 study-skins of birds and marsupials, mostly collected in Australia in the 1930s, presented by Auckland University 1992. McGregor (1894-1977) was head of the Zoology Department at Auckland University where he built up a teaching museum.

McLEAN, J.C.: Eggs of New Zealand birds (154 sets) collected by J.C. McLean during the period 1880-1914, presented by B.L. Chambers 1933-34.

MUNRO, G.C.: New Zealand bird eggs (Ann. Rep. 1888-89). "Egg of Hawk" (Ann. Rep. 1889-90). New Zealand bird skins, nests and eggs (Ann. Rep. 1890-91). "Thirteen bird-skins from the Sandwich Islands [Hawaii]" (Ann. Rep. 1911-12). Birds from New Zealand and Hawaii collected by G.C. & H.S. Munro 1880s and 1890s, presented by A.C. Munro 1954. G.C. Munro was honorary Associate in Ornithology at the Bishop Museum, Hawaii (Munro 1944).

OTAGO MUSEUM, DUNEDIN: Foreign bird skins (100), mammals (7), moa bones, exchanged (Ann. Rep. 1876-77).

PARIS MUSEUM (Muséum National d'Histoire Naturelle), FRANCE: "Extensive series of Mammals, Bird Skins, &c.", exchanged (Ann. Rep. 1877-78).

PARSONS, Mr. J. (of Vava'u, Tonga): "61 Bird Skins, 10 Bats ... various Reptiles", presented (Ann. Rep. 1878-79).

PYCROFT, A.T.: Birds, reptiles and amphibians from the Solomon Islands collected by A.T. Pycroft 1932, presented (Ann. Rep. 1932-33: 43).

RINKE, D.R. (of Germany): 32 study-skins of Tongan birds, presented 1993-94.

ROYAL COLLEGE OF SURGEONS, LONDON: Articulated skeletons of smaller mammals, birds, and other vertebrates, exchanged (Ann. Rep. 1879-80). "Skull of Tiger, Polar Bear, and Camel", exchanged (Ann. Rep. 1883-84).

SMITHSONIAN INSTITUTION, WASHINGTON, D.C.: Either "300" or "over 400" skins of North American birds, exchanged (Ann. Rep. 1886-87). Skeleton of bison, skulls of fur seal and eared seal, exchanged (Ann. Rep. 1890-91). 16 skins of mammals, 10 bird skins, 14 reptiles, exchanged (Ann. Rep. 1891-92).

SMYTH, W. (of Dunedin): New Zealand bird skins, purchased 1885-86, 1886-87 and 1887-88 (Ann. Reps.).

STEAD, E.F. (of Christchurch): Skins, nests and eggs of New Zealand birds, presented (Ann. Rep. 1933-34: 14).

WARD, Prof. H.A. (of Rochester, U.S.A.): Plaster casts of fossils, exchanged, received 1881. "Human Skeleton, set up", exchanged (Ann. Rep. 1883-84). "Mounted Skeleton of African Ostrich", exchanged (Ann. Rep. 1897-98).